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Work Flow with Service Level Agreement

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Abstract:
Allocating service capacities in cloud computing is based on the assumption that they are unlimited and can be used at any time. However, available service capacities change with workload and cannot satisfy users' requests at any time from the cloud provider's perspective because cloud services can be shared by multiple tasks. Cloud service providers provide available time slots for new user's requests based on available capacities. In this, we consider workflow scheduling with deadline and time slot availability in cloud computing. An iterated heuristic framework is presented for the problem under study which mainly consists of initial solution construction, improvement, and perturbation. Three initial solution construction strategies, two greedy- and fair-based improvement strategies and a perturbation strategy are proposed. Different strategies in the three phases result in several heuristics. Experimental results show that different initial solution and improvement strategies have different effects on solution qualities.

I. INTRODUCTION

Nowadays much attention has been paid on workflow scheduling in service computing environments (cloud computing, grid computing, Web services, etc). Resources are generally provided in the form of services, especially in cloud computing. There are two common ways for service delivery: (i) An entire application as a service, which can be directly used with no change. (ii) Basic services are combined to build complex applications, e.g., Xignite and StrikeIron offer Web services hosted on a cloud on a pay-per-use basis [1]. Among a large number of services in cloud computing, there are many services which have same functions and supplied by different cloud service providers (CSPs). However, these services have different non-functional properties. Basic services are rented by users for their complex applications with various resource requirements which are usually modeled as workflows. Better services imply higher costs. Services are consumed based on Service-Level Agreements, which define parameters of Quality of Service in terms of the pay-per-use policy. Though there are many parameters or constraints involved in practical workflow scheduling settings, deadline and time slot are two crucial ones in cloud computing, a new market oriented business model, which offers high quality and low cost information services [2]. However, the two constraints have been considered separately in existing researches. It is necessary to consider both of the constraints jointly because:

(i) Deadlines of the workflow applications need to be met.

(ii) Unreserved time slots are crucial for resource utilization from the perspective of service providers.

(iii) Utilization of time slots in reserved intervals should be improved to avoid renting new resources (saving money). In this paper, we consider the workflow scheduling problem with deadlines and time slot availability (WSDT for short) in cloud computing. To the best of our knowledge, the considered problem has not been studied yet. Service capacities are usually regarded to be unlimited in cloud computing, which can be used at any time. However, from the CSP's perspective, service capacities are not unlimited. Available service capacities change with workloads, i.e, they cannot satisfy user's requests at any time when a cloud service is shared by multiple tasks. Only some available time slots are provided for new coming users by CSPs in terms of their remaining capacities. For example, each activity in Figure 1 has different candidate services with various execution times, costs and available time slots. For activity 4, there are two candidate services with different workloads. If service 0 is selected for activity 4, the execution time is 4 with the price 6 and available time slots [0;4) S [9;14). Time slot [4;9) is unavailable because there is no remaining capacity. The considered WSDT problem is similar to the the Discrete Time/Cost Trade-off Problem (DTCTP) [3] to some extent. We can modify existing algorithms for the latter to the problem under study with less than 200 activities and no more than 20 candidate services in the service pool, spending thousands of seconds. However, the number of activities is usually far more than 200 in practical workflow applications which makes the modified versions are not suitable for the problem under study. Generally, longer execution time implies cheaper cost in cloud computing for the DTCTP. However, this is not true for the WSDT. In other words, the fastest schedule of the WSDT does not mean the highest total cost in a pricing model where the cost is in the inverse proportion to the execution time. For the example depicted in Figure 1 and Table 1, Figure 2 shows the fastest schedule and a non-fastest one where xijk=1 means the kth available time slot of Mj i is selected for vi (Mj I is the jth available service list of vi). In the fastest schedule _1=fx100=1, x200=1, x310=1, x411=1, x510=1, x600=1g, each activity vi chooses the service to finish as early as possible. The finish time is f6=12 and the total cost is 21. The non-fastest schedule is _2=fx100=1, x200=1, x300=1, x401=1, x510=1, x600=1g with the finish time f6=13 and the total cost 27. Figure 2 shows that the total cost of the fastest schedule is less than that of the non-fastest one. Therefore, existing methods for the DTCTP cannot be directly adapted to the WSDT. It is necessary to propose new algorithms for the problem under study. The main contributions of this paper are summarized below:

_ Using mixed integer programming, we mathematically model the cloud workflow scheduling problem with deadlines and time slot availability to minimize total costs from the CSPs perspective.

_ an iterated heuristic framework is presented for the problem under study which includes three phases: initial solution construction, improvement, and perturbation.
_ Concerning for the different characteristics of the considered WSDT problem from the classical DTCTP, effective and efficient rules for the three phases are presented, based on which several heuristics are constructed.
The rest of the paper is organized as follows. The state of the art is reviewed in Section 2. Section 3 describes the WSDT problem and preparations in detail. Section 4 presents the proposed heuristic framework and developed heuristics. Experimental results are given in Section 5, followed by conclusions and future researches in Section 6.

II.MODULE SPECIFICATION

User:

1. User Registration:

A registered user is a user of a website, program, or other system who has previously registered. Registered users normally provide some sort of credentials (such as a username or e-mail address, and a password) to the system in order to prove their identity: this is known as logging in

2. Send Request

User can send the request for work schedule to the cloud service provider.

3. Download Work schedule

Cloud service providers send the request to the User for downloading the work schedule.
Cloud Service Provider:
1. Workload
Cloud service provider can load the amount of work.
2. Work schedule
Work is to be assigned for the user.
3. Authentication
User can authenticate for the available request.
4. Send work
After authenticated the user, CSP can send the work to the User.

III.SYSTEM ANALYSIS

Existing System:

An entire application as a service, which can be directly used with no change. (ii) Basic services are combined to build complex applications, e.g., Xignite and StrikeIron offer Web services hosted on a cloud on a pay-per-use basis [1]. Among a large number of services in cloud computing, there are many services which have same functions and supplied by different cloud service providers (CSPs). However, these services have Different non-functional properties. Basic services are rented by users for their complex applications with various resource requirements which are usually modeled as workflows. Better services imply higher costs. Services are consumed based on Service-Level Agreements, which define parameters of Quality of Service in terms of the pay-per-use policy. Though there are many parameters or constraints involved in practical workflow scheduling settings, deadline and time slot are two crucial ones in cloud computing, a new market oriented business model, which offers high quality and low cost information services [2]. However, the two constraints have been considered separately in existing researches.
(i) Deadlines of the workflow applications need to be met.
(ii) Unreserved time slots are crucial for resource utilization from the perspective of service providers. (iii) Utilization of time slots in reserved intervals should be improved to avoid renting new resources (saving money). In this paper, we consider the workflow scheduling problem with deadlines and time slot availability (WSDT for short) in cloud computing.

Proposed System:

1. Service capacities are usually regarded to be unlimited in cloud computing, which can be used at any time. However, from the CSP's perspective, service capacities are not unlimited. Available service capacities change with workloads, i.e., they cannot satisfy user's requests at any time when a cloud service is shared by multiple tasks.
2. Only some available time slots are provided for new coming users by CSPs in terms of their remaining capacities. For example, each activity in Figure1 has different candidate services with various execution times, costs and available time slots. For activity 4, there are two candidate services with different workloads.
3. Though there are many available time slots, not all of the meet requirements of activities of workflow instances.

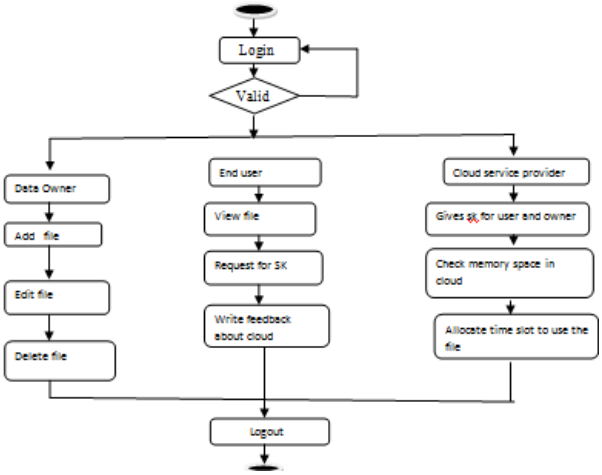

Figure. 1.Activity Diagram

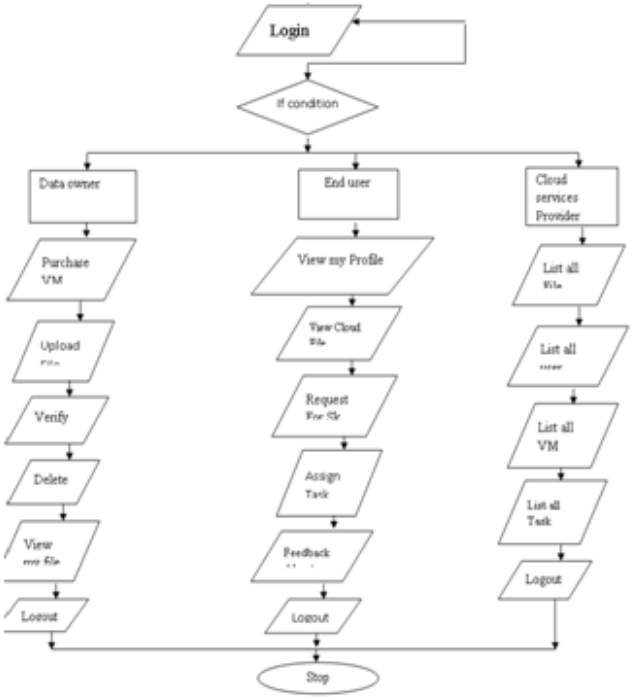

Figure. 2. Flowchart

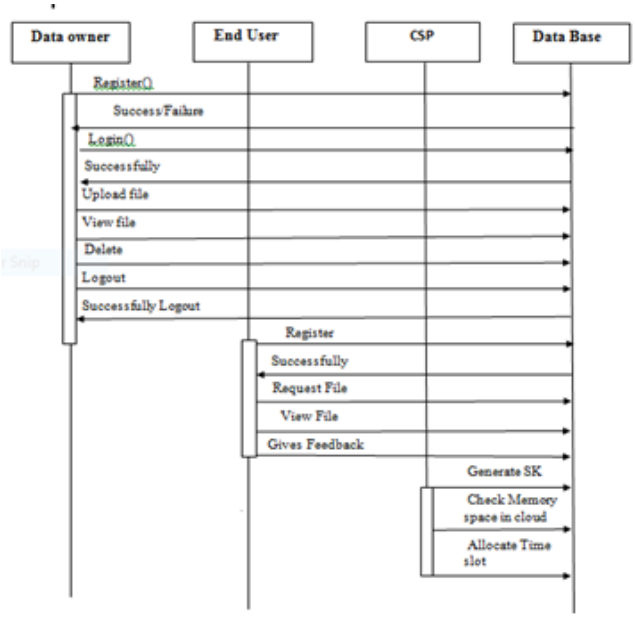

Figure. 3.Sequence Diagram

III.CONCLISION

We have considered workflow scheduling with deadline and time slots constraints in cloud computing to minimize total costs. In this paper, we consider workflow scheduling with deadline and time slot Availability in cloud computing. An iterated heuristic framework is presented for the problem under study which mainly consists of initial solution construction, improvement, and perturbation. Three initial solution construction strategies, two greedy- and fair-based improvement strategies and a perturbation strategy are proposed

IV.FUTURE ENHANCEMENTS

This Project can be used by the clients in later years Ticket can be raised if there is any issues with the Project Development Currently this Project is in its Base levels Future Releases will be more Complex. Different levels of security can be adapted.

V.REFERENCES

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Also a lot of help was provided from this site:

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